



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,606	09/05/2003	Bruno Devos	BOCK-06/119	8003
26875	7590	08/30/2007	EXAMINER	
WOOD, HERRON & EVANS, LLP			MOON, SEOKYUN	
2700 CAREW TOWER			ART UNIT	PAPER NUMBER
441 VINE STREET			2629	
CINCINNATI, OH 45202				
MAIL DATE		DELIVERY MODE		
		08/30/2007 PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<i>Office Action Summary</i>	Application No.	Applicant(s)
	10/656,606	DEVOS ET AL.
	Examiner	Art Unit
	Seokyun Moon	2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 27 June 2007.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-11 and 13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) Claim(s) _____ is/are allowed.
6) Claim(s) 1-11 and 13 is/are rejected.
7) Claim(s) _____ is/are objected to.
8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 05 September 2003 is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) Notice of Informal Patent Application
6) Other: _____.

DETAILED ACTION

Response to Arguments

1. The Applicants' arguments filed on June 27, 2007 have been fully considered.

The arguments regarding the combination of Yeuan and Sakamoto

The Applicants indicated that [the arguments on pg 6 – pg 7],

Furthermore, Sakamoto teaches a matrix of electroluminescent elements in a common cathode configuration as illustrated in FIG. 3 of Sakamoto. Yeuan distinctly teaches away from the common cathode configuration as it is problematic with the thin film electroluminescent elements (TFEL) used. Additionally, Sakamoto teaches individual current sources with each element..., which would change the circuit in Yeuan rendering Yeuan inoperable. Therefore, modifying Yeuan with Sakamoto would render the base reference Yeuan, inoperable. This is certainly not a path that would be taken by a person of ordinary skill in the art. For these reasons, Applicants contend that there is no motivation to combine Yeuan and Sakamoto and therefore the rejections for claims 1 and 13 should be withdrawn.

Examiner respectfully disagrees.

Examiner doesn't see how Yeuan distinctly teaches away from the common cathode configuration. In fact, Yeuan does teach the common cathode configuration as shown in fig. 10. In fig. 10 of Yeuan, all the cathodes of the thin film electroluminescent elements arranged in a column are connected to each other, and thus all the thin film electroluminescent elements in the column have a common cathode configuration. The Applicants further pointed out that common cathode configuration is problematic with the thin film electroluminescent elements. However, the Examiner respectfully requests the Applicants to explain how having common cathode configuration is problematic with thin film electroluminescent elements, since driving thin film electroluminescent elements using a common cathode configuration in a EL display is well known in the art. The Applicants pointed out that, since Sakamoto teaches individual current sources with each element as shown in fig. 1 of Sakamoto, the combination would make the device of Yeuan inoperable. However, Examiner respectfully submits that fig. 1 of Sakamoto just shows a part of the whole display for illustration. In fact, in the display of

Sakamoto, there is one current source for a plurality of light emitting elements included in a column, as shown in fig. 10 of Sakamoto.

Furthermore, as disclosed in the previous rejection, the Examiner only seeks the idea of controlling an electroluminescent display apparatus using a power voltage supply compensation, rather than the whole driving structure, in Sakamoto, for the combination. And one of ordinary skill in the art would easily apply the idea of Sakamoto, i.e. measuring a voltage drop across the EL element and adjusting the power supply according to the measured voltage drop, to the display of Yeuan.

From the foregoing reasons, the Examiner respectfully submits that the Applicants' arguments regarding the combination of Yeuan and Sakamoto are not persuasive.

The arguments regarding the combination of Yeuan, Sakamoto, and Rader

In response to the Applicants' arguments that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Furthermore, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In the arguments, the Applicants also indicated that "*That is, the Rader invention is concerned with battery life only, not the qualities of a particular LED or array of LEDs*" [the arguments on pg 5].

However, as admitted by the Applicants, i.e. “*the power conditioner contains a charge pump that may be used to boost the voltage of a battery that is near the end of its charge in order to provide sufficient voltage to all LEDs to keep them illuminated*” [the arguments on pg 5], Rader’s invention does deal with the quality (ex. luminance) of the array of LEDs. The Applicants further pointed out, “*Rader reference addresses conventional LED technology, not the very different organic LED technology*”. However, Examiner respectfully submits that there is not much difference between the LEDs and OLEDs, in terms of driving.

In this combination (Yeuan, Sakamoto, and Rader), the Examiner merely adopts Rader’s idea, i.e. measuring a voltage drop across the current source for detecting luminance drop of the EL elements and controlling the power supply circuit in order to compensate the luminance drop (note that, in Rader, the EL elements and the current sources are connected in series), rather than the structure of the device of Rader. Since the EL elements are connected in series with the current sources in the device of Yeuan, one of ordinary skill in the art would easily apply Rader’s idea of measuring a voltage drop across a current source instead of measuring a voltage drop across the EL elements for detecting the luminance drop of EL elements, to the display of Yeuan as modified by Sakamoto.

From the foregoing reasons, the Examiner respectfully submits that the Applicants’ arguments regarding the combination of Yeuan, Sakamoto, and Rader are not persuasive.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. **Claims 1, 2, 5, 8-11, and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeuan (US 6,486,607) and Sakamoto (US 5,594,463), and further in view of Rader (US 2004/0233144).

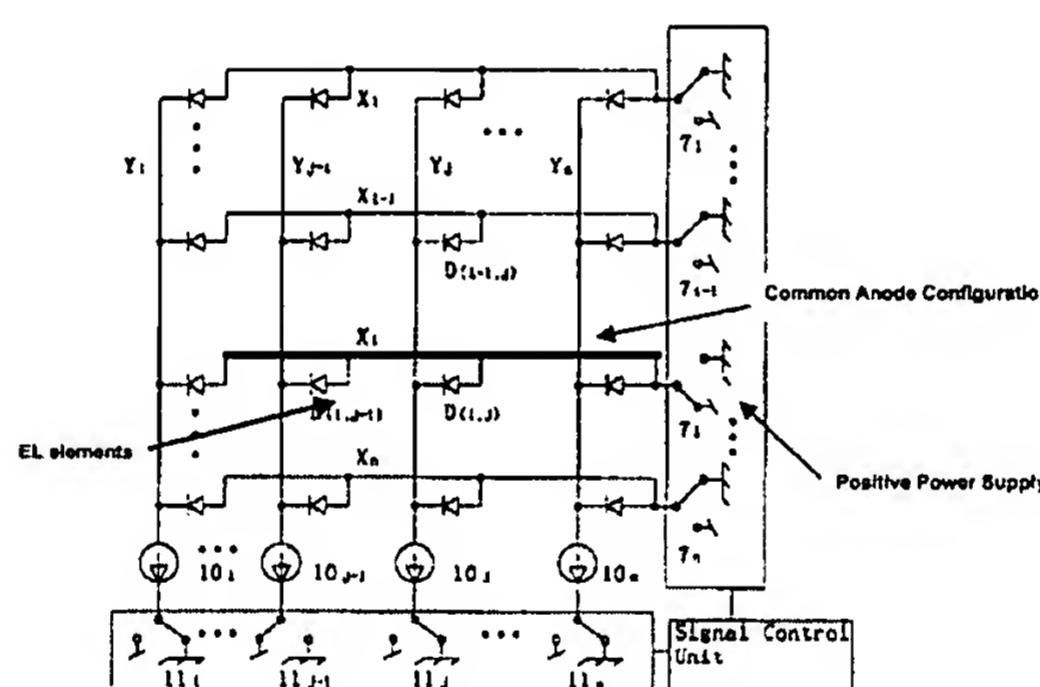
As to **claim 1**, Yeuan [figs. 7 and 10] teaches a method for controlling an electroluminescent display [abstract lines 1-3], the display comprising [drawing 1 provided on page 3 of this office action, which is equivalent to fig. 10 of Yeuan]:

a plurality of EL elements having an anode and a cathode;

the EL elements being arranged in a common anode configuration;

whereby a current source is arranged between each individual cathode of the EL elements and ground;

the anodes of the EL elements are electrically connected in common to a positive power supply



Drawing 1

Yeuan does not teach the method for controlling the electroluminescent display, comprising a power voltage supply compensation.

However, Sakamoto teaches an idea of controlling an electroluminescent display apparatus, using a power voltage supply compensation in which a voltage drop is measured across an EL element and wherein the measured voltage drop is used as an indicator for the light output of the EL elements and wherein a power supply is adjusted in function of the measured voltage drop [col. 2 lines 18-33].

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement a voltage detecting device in the display of Yeuan and to modify the display of Yeuan to change the power supply voltage depending on the voltage drop across the EL elements, which is detected by the voltage detecting device, by adopting Sakamoto's idea, i.e. measuring a voltage drop across the EL element and adjusting the power supply according to the measured voltage drop, in order to allow the display of Yeuan to obtain an appropriate lighting condition of the EL elements, even after the display device is used for a long time, thus to optimize the display function of the display [col. 1 lines 56-59].

Yeuan as modified by Sakamoto does not teach measuring a voltage drop across the current sources to measure a voltage drop across the EL elements.

However, Rader [fig. 2] teaches an idea of measuring a voltage drop across a current source to measure a voltage drop across each of all EL elements [abstract and par. (0019) lines 11-16] when the EL elements and the current source are connected in series, and adjusting a power supply based on the highest voltage drop among the EL elements.

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the idea of Rader of measuring a voltage drop across a current source to measure a voltage drop across each of all EL elements, to the display of Yeuan as modified by Sakamoto, in order to allow the display of Yeuan as modified by Sakamoto to measure the voltage drop across the EL elements easily by measuring the voltage drop across the current sources which are located on non-display region of the display.

Yeuan as modified by Sakamoto and Rader does not expressly teach the EL elements being organic light-emitting diodes.

However, the Examiner takes official notice that it is well known in the art to use organic light-emitting diodes as light-emitting elements in a display apparatus.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display of Yeuan as modified by Sakamoto and Rader to use organic light-emitting diodes as

the EL elements for the display since organic light-emitting diodes are well known for low manufacturing cost.

As to **claim 2**, Yeuan as modified above teaches the power supply being adjusted as discussed with respect to the rejection of claim 1.

Yeuan as modified above does not teach the power supply being adjusted such that the voltage at the cathode of each of the organic light emitting diodes is greater than or equal to a predetermined threshold voltage.

However, Sakamoto further teaches a method of adjusting a power supply such that the voltage at the cathode of each of the light emitting diodes is greater than or equal to a predetermined threshold voltage [Sakamoto: abstract lines 9-15].

It would have been obvious to one of ordinary skill in the art at the time of the invention to specify the method of adjusting the power supply of Yeuan as modified above such that the voltage at the cathode of each of the organic light emitting diodes is greater than or equal to a predetermined threshold voltage, in order to maintain luminance of each of the organic light emitting diodes required for displaying images, and thus to prevent any image degradation.

As to **claim 5**, Yeuan as modified by Sakamoto [Sakamoto: fig. 5] and Rader teaches the method characterized in that the voltage drop is measured via analog-to-digital converters (Sakamoto: "A/D converter 72") [Sakamoto: col. 7 lines 7-20 and fig. 5].

As to **claim 8**, Yeuan as modified above teaches the method characterized in that the organic light-emitting diodes of the display are divided in groups, each group having its own power supply regulation, whereby the above the measurement is carried out per group and the worst case value of the measurement is used for controlling the power supply of the group [Rader: par. (0019) lines 11-16 and par. (0023) lines 7-14].

As to **claims 9 and 10**, Yeuan as modified by Sakamoto and Rader teaches a display tile or a module having power compensation function.

Yeuan as modified by Sakamoto and Rader does not expressly teach the method characterized in that it is used in a large-screen application, the screen being composed of a plurality of display tiles, whereby the control is applied at least individually for each of the tiles and each of the tiles is composed of a plurality of modules and in that the control is applied individually for each of the modules.

However, the courts have held that a mere duplication of the components of the device is generally recognized as being within the level of ordinary skill in the art. St Regis Paper Co. v. Bemis Co. Inc. 193 USPQ 8, 11 (7 TM Cir. 1977).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to duplicate the display apparatus of the display of Yeuan as modified by Sakamoto and Rader, in order to provide a wide display screen while preventing the image degradation caused by long-time use of the display.

As to **claim 11**, Yeuan as modified by Sakamoto and Rader teaches the method characterized in that a limit control is applied, whereby when a present value of maximum power of the display (Sakamoto: "*maximum value able to be set*") or for a module dissipation is obtained for a portion in particular for a tile, the method of controlling is interrupted [Sakamoto: col. 7 lines 51-61].

As to **claim 13**, all of the claim limitations have already been discussed with respect to the rejection of claims 1 and 5 except for a variable power supply including a voltage regulator being operable to adjust the power supply as a function of the measured voltage drop.

Yeuan as modified by Sakamoto and Rader teaches a variable power supply including a voltage regulator (Sakamoto: means for preventing the driving voltage "Vd" to be set to a value greater than the operable maximum voltage value, as disclosed in col. 7 lines 51-61) being operable to adjust the power supply as a function of the measured voltage drop [Sakamoto: col. 2 lines 18-34].

4. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yeuan, Sakamoto, and Rader as applied to claims 1, 2, 5, 8-11 and 13 above, and further in view of Kondakov (US 2004/0135749).

Yeuan as modified by Sakamoto and Rader teaches the method comprising power compensation.

Yeuan as modified by Sakamoto and Rader does not teach the power compensation being performed periodically.

However, Kondakov [par. (0009) and par. (0037) lines 1-3] teaches a method of adjusting the voltage applied across pixels of an OLED display periodically, for compensation.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display of Yeuan as modified by Sakamoto and Rader to perform the power compensation periodically, as taught by Kondakov, in order to compensate degradation of the luminance of the organic light-emitting diodes continuously and periodically, thus to prevent the degradation on the image display during overall display driving period.

5. **Claims 4, 6, and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeuan, Sakamoto, and Rader as applied to claims 1, 2, 5, 8-11, and 13 above, and further in view of Ishizuki et al. (US 2003/0122813, herein after "Ishizuki").

As to **claim 4**, Yeuan as modified by Sakamoto and Rader teaches a method of measuring the voltage drop.

Yeuan as modified by Sakamoto and Rader does not expressly teach the method characterized in activating the organic light-emitting diodes in a predetermined sequence in order to measure the voltage drop.

However, Ishizuki [claim 1, 3rd paragraph "a current measuring part for.., to each pixel;"] teaches the method characterized in activating EL elements in a predetermined sequence ("*said emitting elements*

to independently emit light in succession") in order perform the power compensation ("*drive voltage is adjusted*") [abstract. lines 3-13].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display of Yeuan as modified by Sakamoto and Rader to activate the organic light-emitting diodes in a predetermined sequence for power compensation rather than to activate the diodes randomly, as taught by Ishizuki in order to simplify the operational procedure for power compensation, thus to simplify the driving circuit structure.

As to **claim 6**, Yeuan as modified by Sakamoto and Rader does not teach the method characterized in that at least a number of the measured values of voltage or voltage drop are stored in a storage device for interrogation.

However, Ishizuki [claim 21] teaches a method characterized in measuring a current value by fetching the value of current flowing in power line while causing emitting elements to emit light in succession and storing the measured current values in a memory.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display of Yeuan as modified by Sakamoto and Rader to measure the factor (such as "*the voltage drop across the current source*" for Sakamoto and "*the current flowing in power line*" for Ishizuki) causing irregular luminance of display apparatus after long-time use and to store the factor in a memory, as taught by Ishizuki, to obtain a broaden database for compensation, and thus to provide optimum power compensation to the display apparatus.

As to **claim 7**, Yeuan as modified by Sakamoto and Rader [Rader: fig. 2] teaches the method characterized in that one or more of the current sources each co-operate with a plurality of the organic light-emitting diodes, whereby the voltage drop across such current source is measured for each of the diodes coupled to the corresponding current source [Rader: par. (0019) lines 11-16].

Yeuan as modified by Sakamoto and Rader does not teach the method of measuring the voltage drop across the current source for each of the diodes by sequentially actuating diodes.

However, Ishizuki [claim 2: 3rd par ("a current measuring part for each assigned to each pixel; and") teaches the method of measuring current values by sequentially actuating diodes (by fetching the values of currents flowing in power line while causing emitting elements to emit light in succession).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to actuate the diodes of the display of Yeuan as modified by Sakamoto and Rader sequentially, in order to measure the factor (such as "*the voltage drop across the current source*" for Sakamoto and "*the current flowing in power line*" for Ishizuki) causing irregular luminance of display apparatus after long-time use, for all the organic light-emitting diodes of the modified display, in an organized and simplified way.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (572) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

08/24/2007

- s.m.



SUMATI LEFKOWITZ
SUPERVISORY PATENT EXAMINER